

**Acronym:** SNFM

**Title:** Serial Network Flow Monitor

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**Sponsoring Agency:** National Aeronautics and Space Administration (NASA)

**Increment(s) Assigned:** 9, 10, 11, 12, 19, 20

**Brief Research Summary (PAO):** Using a commercial software CD and minimal up-mass, SNFM monitors the Payload local area network (LAN) to analyze and troubleshoot LAN data traffic. Validating LAN traffic models may allow for faster and more reliable computer networks to sustain systems and science on future space missions.

**Research Summary:**

- This experiment studies the function of the computer network onboard the ISS.
- On-orbit packet statistics are captured and used to validate ground based medium rate data link models and enhance the way that the local area network (LAN) is monitored.
- This information will allow monitoring and improvement in the data transfer capabilities of on-orbit computer networks.

**Detailed Research Description:** The Serial Network Flow Monitor (SNFM) experiment attempts to characterize the network equivalent of traffic jams on board ISS. The SNFM team is able to specifically target historical problem areas including the SAMS (Space Acceleration Measurement System) communication issues, data transmissions from the ISS to the ground teams, and multiple users on the network at the same time. By looking at how various users interact with each other on the network, conflicts can be identified and work can begin on solutions.

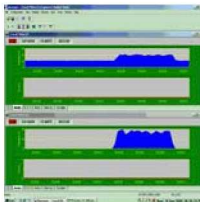
SNFM is comprised of a commercial off the shelf software package that monitors packet traffic through the payload Ethernet LANs (local area networks) on board ISS.

**Project Type:** Payload

### Images and Captions:



This image shows the software CD-ROM which contains the SNFM program. Image courtesy of Nasa, Johnson Space Center.



This image shows an example of network loading displayed graphically. Image courtesy of NASA, Johnson Space Center.

**Operations Location:** ISS Inflight

### Brief Research Operations:

- Crew loads software onto an EXPRESS Laptop, once activated, SNFM monitors the network and captures packet statistics until its buffer has filled, at which point the capture file is saved and then downlinked for further analysis.

**Operational Requirements:** A Commercial Off the Shelf software package is loaded from a CD-ROM to an EXPRESS rack laptop computer. The SNFM also requires use of the ARIS ICE POP. SNFM ground personnel typically coordinate with other network users and/or the POIC to determine when the events they wish to monitor will occur. The SNFM investigation monitors only the medium rate data link (MRDL).

**Operational Protocols:** Crew loads software onto an EXPRESS Laptop Computer (ELC) for Payload LAN monitoring. ELC files will be transmitted to ARIS ICE POP for downlink and packet statistical analysis. Files are downlinked by ground command. Operation of SNFM by the crew will require power up of the EXPRESS Laptop and activation of the selected SNFM Autocapture template. Once activated, SNFM will monitor the network and capture packet statistics until its buffer has filled, at which point the capture file will be sent to the ARIS ICE POP for storage and downlink.

**Review Cycle Status:** **PI Reviewed**

**Category:** Technology Development

**Sub-Category:** Spacecraft Systems

**Space Applications:** Extends ISS accommodations to sub-rack payloads. Provides a set of standard interfaces and resources for sub-rack payloads. Supports the simultaneous and independent operations of multiple payloads within the rack. Accommodates multiple science disciplines.

**Earth Applications:** Locating and correcting computer network problems may alleviate the data downlinking issues. This will provide the scientists on the ground with the data that is necessary for the analysis of the data for their experiments. Some of the results from these experiments may make significant improvements in many areas of human life.

**Manifest Status:** Continuing

**Supporting Organization:** Space Operations Mission Directorate (SOMD)

**Results:** SNFM data are still being analyzed, and will provide "lessons learned" for ongoing network operations on space station and future spacecraft systems.

**Results Status:** Pending More Information

**Last Update:** 03/07/2008